AN INTRODUCTION TO THE HISTORY OF SCIENCE

BY

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TO MY STUDENTS OF THE LAST TWELVE YEARS IN THE CHICAGO AND PITTSBURGH DISTRICTS THIS BOOK IS INSCRIBED IN FURTHERANCE OF THE ENDEAVOR TO INCULCATE A DEMOCRATIC CULTURE, EVER MINDFUL OF THE DAILY TASK, NOT ALTOGETHER IGNORANT OF THE ACHIEVEMENTS OF THE PAST

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PREFACE

THE history of science has something to offer to the humblest intelligence. It is a means of imparting a knowledge of scientific facts and principles to unschooled minds. At the same time it affords a simple method of school instruction. Those who understand a business or an institution best, as a contemporary writer on finance remarks, are those who have made it or grown up with it, and the next best thing is to know how it has grown up, and then watch or take part in its actual working. Generally speaking, we know best what we know in its origins.

The history of science is an aid in scientific research. It places the student in the current of scientific thought, and gives him a clue to the purpose and necessity of the theories he is required to master. It presents science as the constant pursuit of truth rather than the formulation of truth long since revealed; it shows science as progressive rather than fixed, dynamic rather than static, a growth to which each may contribute. It does not paralyze the self-activity of youth by the record of an infallible past.

It is only by teaching the sciences in their historical development that the schools can be true to the two principles of modern education, that the sciences should occupy the foremost place in the curriculum and that the individual mind in its evolution should rehearse the history of civilization.

The history of science should be given a larger place than at present in general history; for, as

Bacon said, the history of the world without a history of learning is like a statue of Polyphemus with the eye out. The history of science studies the past for the sake of the future. It is a story of continuous progress. It is rich in biographical material. It shows the sciences in their interrelations, and saves the student from narrowness and premature specialization. It affords a unique approach to the study of philosophy. It gives new motive to the study of foreign languages. It gives an interest in the applications of knowledge, offers a clue to the complex civilization of the present, and renders the mind hospitable to new discoveries and inventions.

The history of science is hostile to the spirit of caste. It shows the sciences rising from daily needs and occupations, formulated by philosophy, enriching philosophy, giving rise to new industries, which react in turn upon the sciences. The history of science reveals men of all grades of intelligence and of all social ranks coöperating in the cause of human progress. It is a basis of intellectual and social homogeneity.

Science is international, English, Germans, French, Italians, Russians — all nations — contributing to advance the general interests. Accordingly, a survey of the sciences tends to increase mutual respect, and to heighten the humanitarian sentiment. The history of science can be taught to people of all creeds and colors, and cannot fail to enhance in the breast of every young man, or woman, faith in human progress and good-will to all mankind.

This book is intended as a simple introduction, taking advantage of the interests of youth of from

seventeen to twenty-two years of age (and their intellectual compeers) in order to direct their attention to the story of the development of the sciences. It makes no claim to be in any sense complete or comprehensive. It is, therefore, a psychological introduction, having the mental capacity of a certain class of readers always in view, rather than a logical introduction, which would presuppose in all readers both full maturity of intellect and considerable initial interest in the history of science.

I cannot conclude this preface without thanking those who have assisted me in the preparation of this book — Sir William Osler, who read the first draft of the manuscript, and aided me with his counsel; Dr. Charles Singer, who read all the chapters in manuscript, and to whom I am indebted for advice in reference to the illustrations and for many other valuable suggestions; the officers of the Bodleian Library, whose courtesy was unfailing during the year I worked there; Professor Henry Crew, who helped in the revision of two of the chapters by his judicious criticism; Professor J. E. Rush, whose knowledge of bacteriology improved the chapter on Pasteur; Professor L. O. Grondahl, who read one of the chapters relating to the history of physics and suggested important emendations; and Dr. John A. Brashear, who contributed valuable information in reference to the activities of Samuel Pierpont Langley. I wish to express my gratitude also to Miss Florence Bonnet for aid in the correction of the manuscript.

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